

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
17 November 2005 (17.11.2005)

PCT

(10) International Publication Number
WO 2005/107420 A3

(51) International Patent Classification:

F2IS 19/00 (2006.01) *F2IS 9/00* (2006.01)

(21) International Application Number:

PCT/US2005/015736

(22) International Filing Date: 5 May 2005 (05.05.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

60/568,373 5 May 2004 (05.05.2004) US
60/636,123 15 December 2004 (15.12.2004) US

(71) Applicant (for all designated States except US): **RENS-SELAER POLYTECHNIC INSTITUTE** [US/US]; 110 8th Street, Troy, NY 12180-3590 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **NARENDRA, Nadarajah** [US/US]; 37 Lierty Way, Clifton Park, NY 12065 (US). **GU, Yimin** [CN/US]; 41 Brinsmade Terrace, Troy, NY 12180 (US). **FREYSSINIER, Jean, Paul** [US/US]; 24 Brinsmade Terrace, Troy, NY 12180 (US).

(74) Agent: **ETKOWICZ, Jacques, L.**; RatnerPrestia, P.O. Box 980, Valley Forge, PA 19482 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

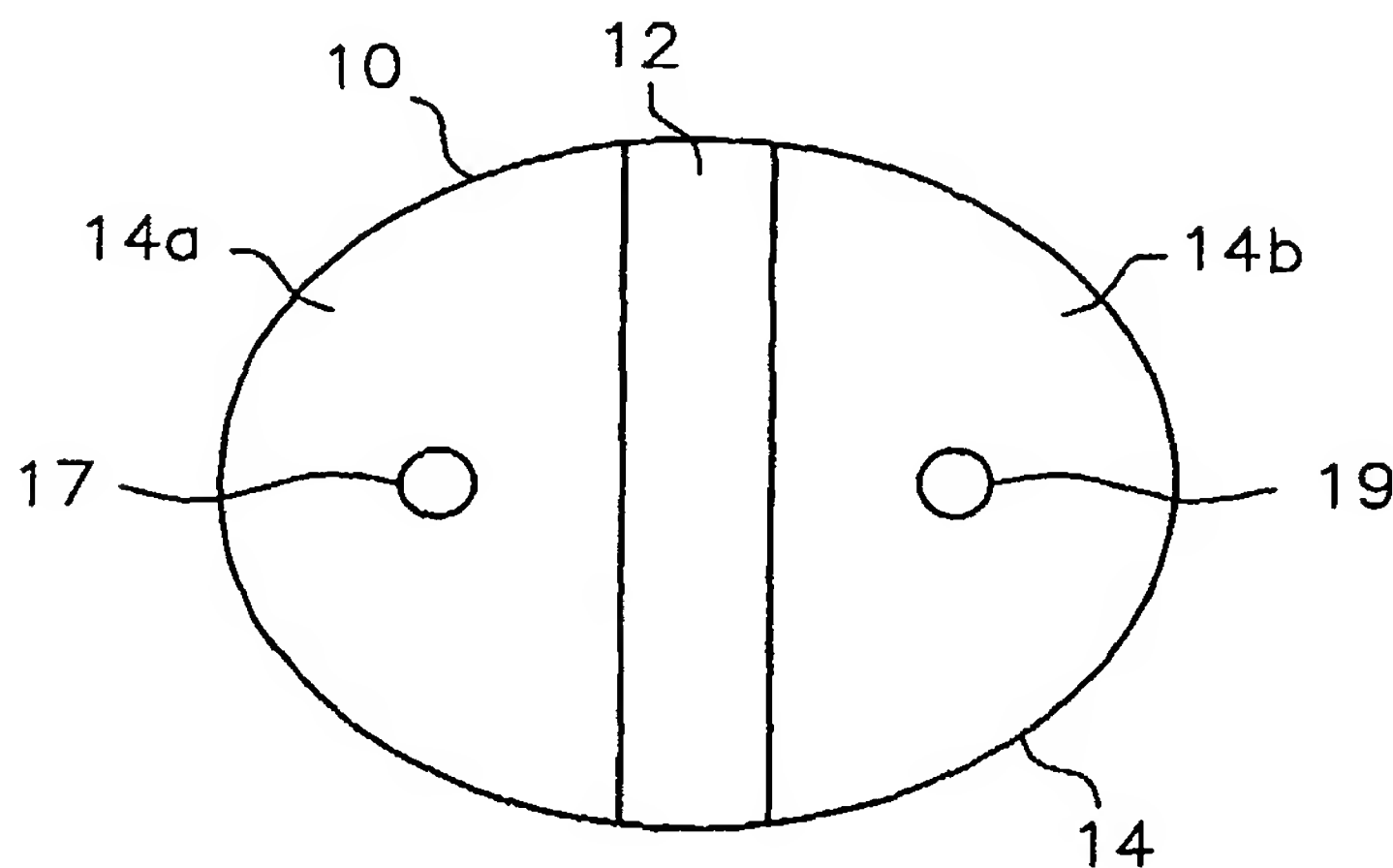
Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
26 May 2006

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: HIGH EFFICIENCY LIGHT SOURCE USING SOLID-STATE EMITTER AND DOWN-CONVERSION MATERIAL



(57) Abstract: A light emitting apparatus includes a source of light (17); a down conversion material (12) receiving the emitted light, and converting the emitted light into transmitted light and backward transmitted light; and an optic device (14a, 14b) configured to receive the backward transmitted light and transfer the backward transmitted light outside of the optic device. The source (17) of light is a semiconductor light emitting diode, a laser diode or a resonant cavity light emitting diode. The down conversion material includes one of phosphor or other material for absorbing light in one spectral region and emitting light in another spectral region. The optic device, or lens, includes light transmissive material.

WO 2005/107420 A3